UNIVERSITY OF GONDAR
COLLEGE OF MEDICINE AND HEALTH SCIENCE
SCHOOL OF MEDICINE
DEPARTMENT OF OPTOMETRY

KNOWLEDGE, ATTITUDE AND ASSOCIATED FACTORS AMONG PRIMARY SCHOOL TEACHERS REGARDING REFRACTIVE ERROR IN SCHOOL CHILDREN IN GONDAR CITY, NORTHWEST ETHIOPIA.

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Abbreviations

RE	Refractive Error
URE	Uncorrected Refractive Error
SPSS	Statistical Package for the Social Sciences
VI	Visual Impairment

Abstract

Introduction: Refractive error is an important cause of correctable visual impairment in the worldwide with a global distribution of 1.75% to 20.7% among schoolchildren. Knowledge of refractive error play an important role in encouraging people to seek treatment that helps in reducing the burden of visual impairment in a society. There is limited data regarding knowledge, attitude and associated factors about refractive error in schoolchildren among primary school teachers in Ethiopia as well as in the study area.

Objective: To determine knowledge, attitude and associated factors among primary school teachers regarding refractive error in school children in Gondar city.

Methods: Institution based cross sectional study was conducted on 565 primary school teachers from April 20 to May 23, 2017 in Gondar city. Simple random sampling method was used to select schools. All primary school teachers from selected schools were included in the study. A pretested and structured self-administered questionnaire was used to collect data. The data was entered into EpiData version 3.1 then exported to SPSS version 20 for processing and analysis. Binary logistic regression was fitted and variables which had P value of <0.05 in the multivariable analysis were considered as statistically significant.

Result: A total of 565 study subjects were participated in this study with a mean age of 42.05 ± 12.01 years. Of these study participants 55.9% (95% CI: 51.9, 59.8) had good knowledge and 57.2% (95% CI: 52.9, 61.4) had favorable attitude towards refractive error. History of spectacle use [AOR=2.13 (95% CI: 1.32, 3.43)], history of eye examination [AOR= 1.67 (95% CI: 1.19, 2.34)], training on eye health [AOR= 1.94 (95% CI; 1.09, 3.43)] and 11-20 years of experience [AOR =2.53 (95% CI: 1.18, 5.43)] were positively associated with knowledge. Whereas being male [AOR = 2.03 (95% CI: 1.37, 3.01)], older age [AOR= 3.05 (95% CI: 1.07, 8.72)], 31-40 years of experience [AOR= 0.23 (95% CI: 0.07, 0.72)], private school type [AOR= 1.76 (95% CI: 1.06, 2.93)] and 5^{th} -8^{th} teaching category [AOR = 1.54 (95% CI: 1.05, 2.24)] were associated with attitude.

Conclusion: knowledge and attitude of study subjects were low which needs training of teachers about refractive error.

Key words: Refractive error, knowledge, attitude, school teachers, Gondar, Ethiopia

1. Introduction

1.1 Statement of the problem

A refractive error (RE) is an error in the focusing of light on the retina. it is one of the most common ocular conditions, and uncorrected refractive error (URE) is a major public eye health challenge (1). Worldwide, URE is the leading cause of visual impairment (VI) and second leading cause of blindness(2). The pattern of RE among children has considerable variation from one geographic location to the other which is attributable to hereditary and environmental factors (3). According to world health organization (WHO), refractive error is responsible for 42% and 3% of visual impairment and blindness respectively in the world (2). The magnitude of refractive error across the world among schoolchildren ranges from 1.75% to 20.7% (4-10).

Blindness due to refractive error affects a person many more years comparing to a person becoming blind from cataract in old age. This would place a greater socioeconomic burden on the society. Additionally its complication can hinder educational performance, personality development, and future career opportunities of the schoolchildren (11).

Undetected and untreated vision problems interfere with the ability to perform to one's full learning potential. To lessen this impact exploration of knowledge and attitude in a population is very important (12).

Knowledge of primary school teachers towards refractive error play an important role in encouraging children to seek treatment for their eye problems as well as to enhance eye health seeking behavior(13). In addition to this, it helps to minimize the burden of visual impairment due to uncorrected refractive errors (14, 15). Having this importance the level of knowledge in different studies ranges from 1% to 89% (15-20). Attitude of primary school teachers towards refractive error also has positive impact for prevention of from refractive error in school children (21). In contrast negative attitude towards refractive error management options can result psychological impact as revealed in different studies (22, 23).

To minimize such burdens by delivering training about refractive error, a base line data about school teachers' knowledge and attitude towards refractive error is indispensable.

Although refractive error among schoolchildren is a common public vision problem, vision screening by school teachers is not established due to lack of information regarding their knowledge, attitude and related factors towards refractive error particularly in the study area. Therefore, this study determines the knowledge, attitude and related factors among primary school teachers towards refractive error in school children so that it will help respective stake holders to act accordingly.

1.2 Literature review

1.2.1 Magnitude of refractive error among schoolchildren

Magnitude of refractive error has a great variation in the world. Childhood visual impairment due to refractive errors is significant but avoidable problem, if it is detected and treated early. Data from WHO indicates that refractive error is one of the major causes of visual impairment in the world which accounts 33%(2). Blindness due to refractive error in any population implicates that eye care services, which includes vision screening by school teachers, in that population are inadequate (11). In the world, about twelve million children are suffer from uncorrected refractive error(24).

1.2.2 Knowledge of teachers towards refractive error

Literatures done on knowledge, attitude and associated factors on refractive error were more focused at community level. Depending on the study population and other parameters level of knowledge and attitude towards refractive error varied widely.

A cross-sectional study undertaken to assess the knowledge of 75 primary school teachers regarding early identification and management of refractive errors among school children in India, in 2016 showed that only 1% of the study participants had adequate knowledge towards refractive error. While 87% and 12% of had average and inadequate knowledge towards RE respectively(15). Another cross-sectional comparative study done in India to assess knowledge of primary school teachers towards refractive error in 2013, showed that most of the study participants (68% among urban primary school teachers, 72% among rural) had good knowledge about RE, while 20%,10% and 2% of the had satisfactory, very good and poor level of knowledge respectively(16).

Descriptive cross-sectional study done in India, in 2013 to assess awareness of 60 primary school teachers regarding refractive errors and its early identification among primary school children revealed that 80% had adequate knowledge(19).

A population based study done in Singapore, in 2009 that determined knowledge and beliefs associated with refractive error revealed that 62.6% of them had good knowledge towards RE(18).

A cross-sectional study conducted in Pakistan to explore the perceptions of primary school teachers towards eye health showed that teachers had good knowledge about refractive error symptoms in children that ranges from 12.5% - 75%. The most mentioned symptoms like difficulty of seeing the blackboard well, holding books too close and difficulty of reading book But they were not aware of other symptoms and signs of uncorrected refractive errors such as short attention span, difficulty of writing in straight lines, headache, and low self-esteem(25).

Institution based cross-section study in Saudi Arabia done to assess the awareness, knowledge, attitudes and practices associated with eye diseases in the population showed that 89% of study participant has good level of knowledge towards refractive error (26).

Descriptive cross-sectional study done in Ghana to assess perspectives on child eye health among 346 junior high school teachers showed that level of knowledge towards refractive error was 82.08 % and 93% of respondents identified blur vision as the commonest symptom of refractive error (21).

Institution based cross-sectional study done in Nigeria to assess knowledge of vision disorders in primary school children among 130 teachers indicated that 86.7% of them had good level of knowledge towards refractive error namely myopia(20). Another descriptive cross-sectional study from Kenya indicates varied level of knowledge towards RE among general pediatrician. While 98.40% of respondents said that children could get refractive errors, but 80.8% of respondents did not know how to detect it(27).

Therefore knowledge towards refractive error varies widely across the world.

1.2.3 Attitude of teachers towards refractive error

A study done in India, in 2011 regarding the perceptions of refractive errors and their psychosocial impact on youth showed that 23.3% respondents felt using spectacles for a long time would harm the eyes or lead to early blindness and 30% of the respondents believed that the continuous use of glasses would progressively increase the refractive error which implicates unfavorable attitude on refractive error prevention(23).

A population based study in Singapore, in 2009 that determined knowledge and beliefs associated with refractive error revealed that significantly higher proportion of uncorrected subjects (36.4%) did not think that their vision would be poor if they were not wearing spectacles with the correct prescription and most of them (59.6%) believed that perfect vision is not necessary for their daily activities(18).

Descriptive cross sectional study done in Ghana, in 2016 towards perspectives on Child eye health among junior high school teachers revealed that 90% of the total respondents believed that schoolchildren can wear spectacles. Sixty-four percent of respondents agreed that childhood blindness can be prevented(21).

Therefore attitude towards refractive error varies widely.

1.2.4 Associated factors affecting knowledge and attitude of teachers towards refractive error

There are factors that may affect knowledge and attitude of teachers towards refractive error. The major associated factors revealed through different literatures are: socio-demographic characteristics, income, educational status, years of experience, history of spectacle use, duration of spectacle use, family spectacle use, history of eye examination, school type, training on eye health, major teaching category, and use of information.

Socio-demographic factors

As a cross-sectional study done in India and Ghana indicated that being older age is associated with good level of knowledge(16, 21) Another descriptive cross-sectional study done in India indicated that females have negative attitude towards refractive correction with spectacle(23). But from another community based cross-sectional study in Cambodia indicates females had positive attitude towards VI due to refractive error compared to males(28). Income also affects level of knowledge about refractive error and attitudes in which those with higher income exhibited good level of knowledge and positive attitude as indicated in a population based cross-sectional study done in Saudi Arabia, but factors like religion and marital status were not associated(26).

Education related factors

Those with higher educational status and worked for many years had good knowledge and attitude towards refractive error as indicated in a cross-sectional study done in India and Saudi Arabia(16, 21, 26). Another cross-sectional study in Nigeria showed that school type had influence on knowledge of teachers towards refractive error, those working in private schools showed good knowledge in identification of RE, but major teaching category has not association(20).

Eye condition related factors

A cross-sectional population based study in Singapore showed that use of spectacle can affect teachers' knowledge towards refractive error. In addition to this spectacle use for longer period of time affects the knowledge of teacher towards RE. And also previous eye examination has positive association on level of knowledge and attitude compared to with those who had never visit eye examination(18).

Information related factors

Previous training on eye health has significant association with knowledge and attitude as indicated in study done in India (13, 20). Source of information like media can also influence level of knowledge as indicated in a descriptive cross-sectional study done in Ghana but parental spectacle use was not associated(21).

1.2.5 Conceptual frame-work

Variables that had association with knowledge and attitude were developed from literatures and grouped and displayed as follows

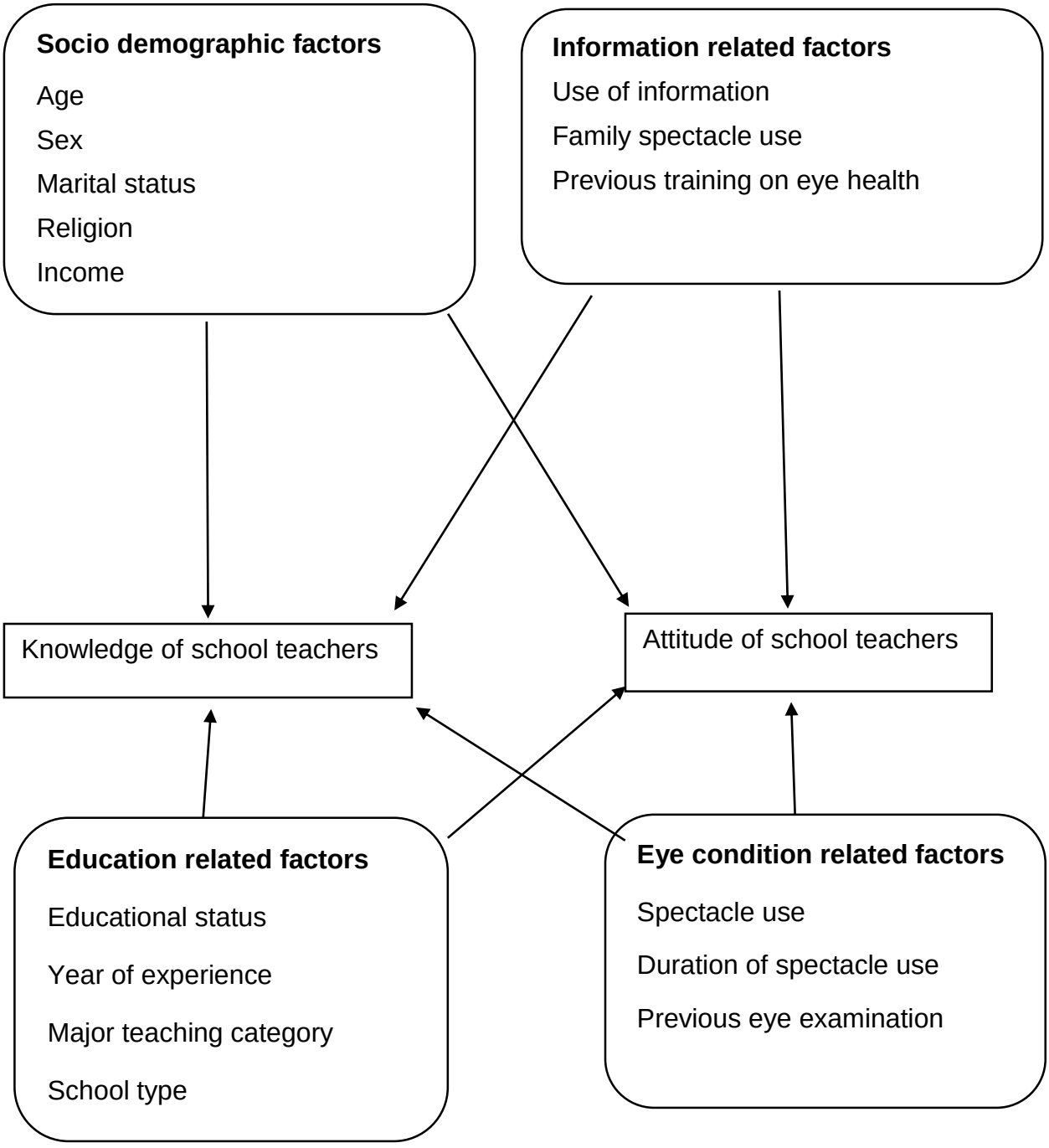

Figure 1. Shows conceptual framework for knowledge and attitude of teachers on refractive error

1.3 Justification

The school age years are formative for children in determining their physical, intellectual and behavioral development. Children may not be aware of refractive errors which are a significant problem among them and have a considerable impact on the public eye health. Children spent a significant portion of the time in the school and it is important for the teachers to identify the refractive errors in the early stage so as to prevent blindness and other complications. To do this assessment of teachers' knowledge and attitude toward refractive error and identifying associated factors is necessary.

Moreover, there was limited data regarding knowledge, attitude and associated factors towards refractive error among teachers in Ethiopia as well as in the study area. So this study offers valuable information for decision makers, health care planners and evaluators, and other concerned bodies to train teachers.

2. Objective

2.1 General objective

To assess knowledge, attitude and associated factors among primary school teachers regarding refractive error in school children in Gondar city, Northwest Ethiopia, 2017.

2.2 Specific objectives

- To determine the knowledge of primary school teachers towards refractive error
- To determine the attitude of primary school teachers towards refractive error
- To identify associated factors affecting knowledge of teachers towards refractive error
- To identify associated factors affecting attitude of teachers towards refractive error

3. Methods

3.1 Study design

Institution based cross sectional study was used.

3.2 Study area and period

The study was conducted in Gondar city, Northwest Ethiopia, between April 20 and May 23, 2017. A data obtained from North Gondar zone administration finance and economic office indicated that, Gondar city is located in North Gondar zone which is situated 748 km from the capital city, Addis Ababa. According to the office, it had a population of 351, 675 divided in 24 kebeles and 10 sub-cities (29). According to the Gondar city administrative educational office there were 64 primary schools (43 governmental and 21 private schools) that totally hosts 49, 957 students and 1644 teachers. There is one government hospital-University of Gondar tertiary eye care and training center and two private eye clinics which provide different specialty eye care services and training of eye care professionals such as Optometrists and Ophthalmologists.

3.3 Source and Study population

All teachers who were working in primary schools in Gondar city.

3.5 Inclusion and exclusion criteria

3.5.1 Inclusion criteria

All school teachers who were working in primary schools during the data collection period.

3.6 Sample size determination

Since the variability of proportion was not known in Ethiopia as well as in the study area, p=0.5 was used for determination of sample size. By taking 1644 primary school teachers as source population and using OpenEpi software package for determination of sample size, which uses the following formula for finite population(30).

$$n = \frac{Nz^2pq}{d^2(N-1)+z^2pq}$$

Where n = sample size

N = source population

P = proportion= 0.5

q = 1-p = 0.5

d = margin of error= 3.5

z= Value of z statistic at 95% confidence interval = 1.96

The sample size was 532.

Therefore, by considering 10% to non-response rate the final required sample size was 586.

3.7 Sampling technique and procedures

To ensure representativeness, samples were taken from about 25% of the total 64 primary schools. Seventeen schools out of 64 schools were selected using simple random sampling method after a list of schools obtained from the Gondar city administrative educational office. In the 17 selected schools (10 government and 7 private schools) there were a total of 587 teachers. So, all of these teachers were included in the study.

Diagrammatic representation of sampling procedure and technique was displayed as follows.

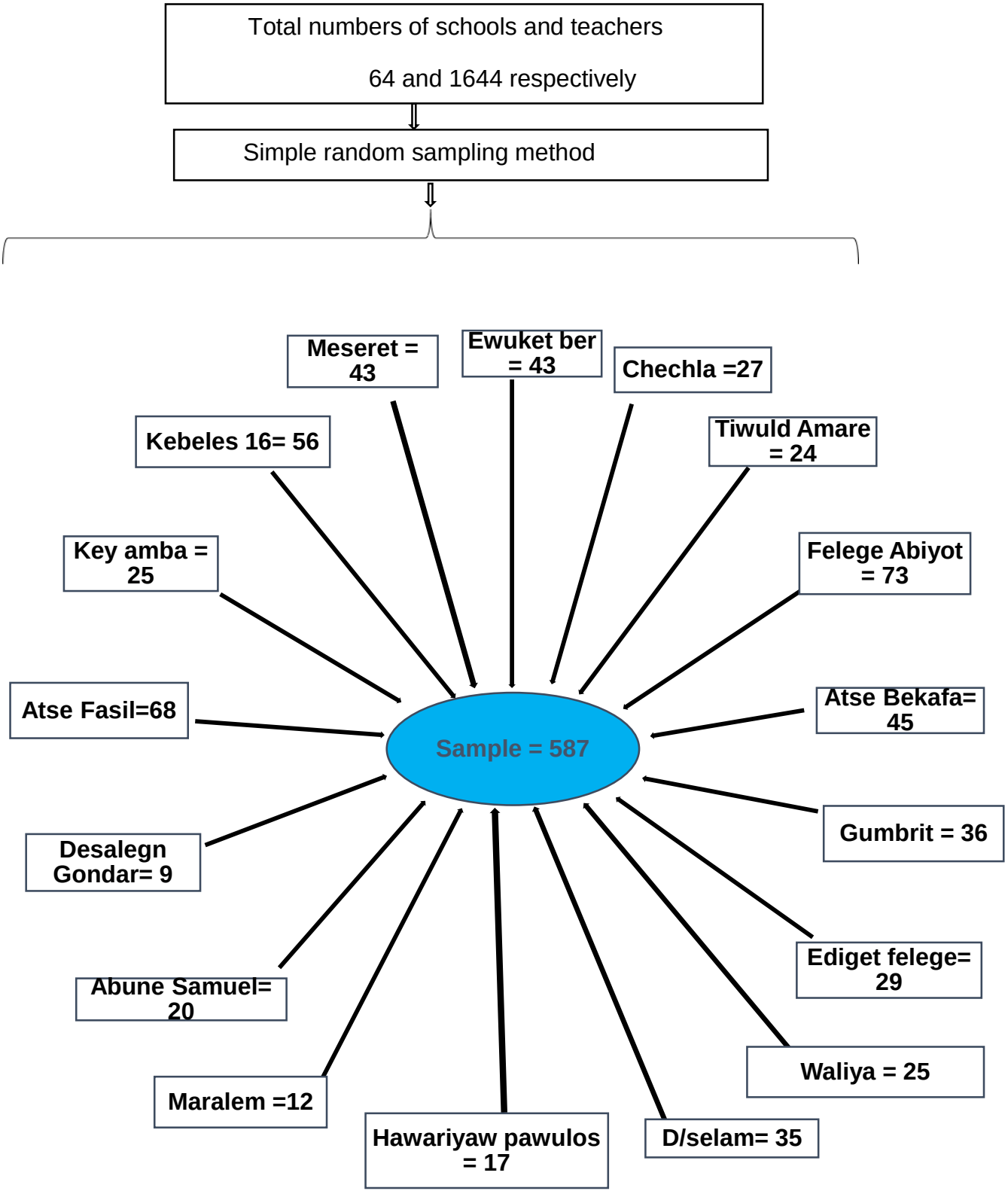

Figure 2. Shows schematic representation of sampling procedure and technique

3.8 Variables of the study

3.8.1 Dependent variables

- Knowledge towards refractive error
- Attitude towards refractive error

3.8.2 Independent variables

A. socio-demographic factors

- Age
- Sex
- Religion
- Marital status
- Income

B. Education related factors

- Educational status
- Year of experience
- Type of school
- Major teaching category

C. Eye condition related factors

- Spectacle use
- Duration of spectacle use
- Previous eye examination

D. information related factors

- Use of information
- Family spectacle use
- Previous training on eye health

3.9 Operational definition

Knowledge

The knowledge of refractive error was assessed using 18 points scale. There were eleven multiple choice questions that carried a total of 18 correct responses. Each correct response was given a score of 1 and a wrong response a score of 0. Total points to be scored were 18 and the minimum was 0.

Good knowledge: Individuals who responded the mean and above of the total knowledge questions had good knowledge about refractive error in school children.

Poor knowledge: Individuals who responded below the mean of the total knowledge questions had poor knowledge about refractive error in school children.

Attitude

Attitude was assessed by eight questions put on Likert's scale. The questions on Likert's scale had positive and negative responses that ranged from strongly agree, agree, neutral, disagree and strongly disagree. The scoring system used with respect to participant's responses was as follows: strongly agree 5, agree 4, neutral 3, disagree 2, and strongly disagree 1.

Favorable attitude: Respondents who answered greater than or equal to the mean attitude questions had favorable attitude.

Unfavorable attitude: Respondents who answered below the mean attitude questions had unfavorable attitude.

3.10 Data collection procedures and personnel

Pre-tested and structured self-administered questionnaire, which was translated into Amharic version (local language) from English version and then back to Amharic for consistency and easy of interview, was used on selected teachers to collect data. Trained eight optometrists were participated in the data collection.

3.11 Data quality control

Pretest was done out of the study area to validate the questionnaire by taking 5% of the sample size. After doing the pre-test, necessary modifications were made accordingly before actual data collection was performed. Training was given for data collectors on how to collect the data. On the field work, the supervisor was closely followed the day-to-day data collection process and ensure internal consistency of the collected data. Finally 5% of the collected samples were checked for completeness by the principal investigator in each day.

3.12 Data processing and analysis

After cleaning and coding, the data were entered into EpiData version 3.1 and were exported and analyzed using SPSS version 20. Analysis was done by the principal investigator using the same computer package. The variables that were found with $P<0.2$ at binary logistic regression were entered to multivariable analysis and those variables with p-value less than 0.05 were considered as statically significant.

4. Ethical Consideration

Ethical clearance was obtained from the ethical review board of University of Gondar. Officials at school of medicine, Gondar city administrative education office and selected schools were communicated through formal letters obtained from the ethical review board of University of Gondar. Each participating school was visited a week before the data collection day, and permission to conduct the study was taken from the schools. Written informed consent was obtained from each study participants. Participants were informed about the objective of the study and they were given full right to discontinue or refuse to participate in the study.

5. Results

5.1 Socio- demographic characteristics of the study participants

A total of 565 primary school teachers who were working in Gondar city took part in the study with a response rate of 96.3%.

Among those 52.9 %(299) were females. The mean age of the study participants was 42.05 years (SD = ± 12.01 years). Most of the study participants (78.6%) were orthodox Christian. Primary school teachers who earned diploma accounts 75.7%. Of the total participants 63.4% were married. On the other hand 416(73.6%) teachers were enrolled in governmental schools in which 240(57.7%) of them taught from grade 5^{th} to 8^{th} (see table 1).

Table1. Socio-demographic characteristics of study participants in Gondar city, Northwest Ethiopia, 2017

Variables	Frequency	Percent
Age category		
21-30 years	155	27.4
31-40 years	106	18.8
41-50 years	107	18.9
51-70 years	197	34.9
Sex		
Female	299	52.9
Male	266	47.1
School type		
Government	416	73.6
private	149	26.4
Religion		
Orthodox	444	78.6
Muslim	74	13.1
Protestant	47	8.3
Educational status		
Certificate	40	7.1
Diploma	428	75.7
Degree	97	17.2
Monthly income in birr		
1000- 2180	39	6.9
2181- 3361	147	26.0
3362- 4541	194	34.3
4542- 5722	147	26.0
>5723	38	6.8

5.2 **Attitude and level of knowledge towards refractive error among study participants**

Out of 565 study participants 316 (55.9%) (95% CI: 51.9, 59.8) had good knowledge. Among study participants, who had poor knowledge, 82(14.5%) didn't know what refractive error is. Blurring of vision was the most known symptoms by study participants.

From the total respondents 323(57.2%) (95% CI: 52.9, 61.4) had favorable attitude towards refractive error. Among study participants 285(50.4%) agreed that non eye care professionals can perform vision screening on children. Most study participants (89.6%) agreed that complication of refractive error can be prevented (see table 2).

Respondents who used information (84.60%) like mass media, health personnel and colleague were found to have good knowledge (60.88%) and favorable attitude (54.39 %) towards refractive error.

Table 2.Proportion of level of knowledge and attitude towards refractive error among study participants in Gondar city, Northwest Ethiopia, 2017.

Variables	Frequency	Percent
Level of knowledge(n=565)		
Good	316	55.9
Poor	249	44.1
Attitude(n=565)		
Favorable	323	57.2
Unfavorable	242	42.8

5.3 Factors associated with level of knowledge towards refractive error

In the bi-variable analysis being older age, Muslim, years of experience, higher level of educational status, being married, high income, working in private school, previous eye examination, use of spectacle, previous training on eye health and family spectacle use show association with level of knowledge towards refractive error among primary school teachers. Whereas in multivariable analysis years of experience, previous history of eye examination, history of spectacle use and previous training on eye health were found to be significantly associated with knowledge (see table 3).

Table 3. Factors associated with knowledge of study participant regarding refractive error in school children in Gondar city, Northwest Ethiopia, 2017.

Variables	knowledge			
	Good	Poor	COR (95% CI)	AOR (95% CI)
Family spec use				*
No	230	195	1.00	
Yes	86	54	1.35(0.91, 1.99)	
School type				*
Government	239	177	1.00	
Private	77	72	0.79(0.54, 1.15)	
Religion				*
Orthodox	256	188	1.00	
Muslim	39	35	0.82(0.49,1.34)	
Protestant	21	26	0.59(0.32,1.09)	

Spectacle usage				
No	174	188	1.00	1.00
Yes	142	61	2.52(1.75, 3.62)	2.13(1.32,3.43)**
Monthly income in birr				*
1000- 2180	18	21	1.00	
2181- 3361	74	73	1.83(0.58, 2.40)	
3362- 4541	110	84	1.53(0.77, 3.05)	
4542- 5722	90	57	1.84(0.90, 3.75)	
>5723	24	14	2.00(0.80, 4.98)	
Previous eye exam				
No	141	143	1.00	
Yes	175	106	2.01(1.12,3.59)	1.67(1.19, 2.34)**
Marital status				*
Single	57	62	1.00	
Married	218	140	1.69(1.12, 2.57)	
Divorced	28	28	1.09(0.78, 2.05)	
Widowed	13	*19*	0.74(0.34, 1.64)	
Educational status				*
Certificate	26	14	1.00	
Diploma	229	199	0.62(0.32, 1.22)	
Degree	61	36	0.91(0.42,1.97)	

Training on eye health				
No	263	228		
Yes	53	21	2.19(1.28, 3.74)	1.94(1.09, 3.43)**
Age in years				*
21-30 years	75	80	1.00	
31-40 years	49	57	0.92(0.56, 1.50)	
41-50 years	58	49	1.26(0.77, 2.07)	
51-70 years	134	63	2.27(1.47, 3.50)	
Years of experience				
1-10 years	59	79	1.00	1.00
11-20 years	81	70	1.55(0.97, 2.47)	2.53(1.18, 5.43)**
21- 30 years	81	54	2.01(1.24, 3.25)	2.48(0.87, 7.02)
31-40 years	95	46	2.77(1.69, 4.50)	2.16(0.67, 2.00)

* Non-significant , ** P-value <0.05

Table 3 showed that the odds of good knowledge regarding refractive error among study participants who had previous history of spectacle were two times greater than the odds of good knowledge for those subjects who didn't use spectacle [AOR=2.13 (95% CI: 1.32, 3.43)]. In addition to this the odds of good knowledge regarding refractive error among study participants with previous history of eye examination were 1.67 times larger than the odds of good knowledge for those subjects with no history of eye examination [AOR= 1.67 (95% CI: 1.19, 2.34)]. The odds of good knowledge regarding refractive error among study participants who had previous training on eye health were two times greater than the odds of good knowledge for study subjects with no history of training on eye heath [AOR= 1.94 (95% CI; 1.09, 3.43)]. The odds of good knowledge regarding refractive error among subjects with 11-20 years of experience were 2.53 times higher than the odds of good knowledge among subjects who had 1-10 years of experience [AOR =2.53 (95% CI: 1.18, 5.43)].

5.4 Factors associated with attitude of study participants towards refractive error

In the bi-variable analysis age, religion, many years of experience, being divorced, working in private school, 5^{th} -8^{th} teaching category, sex being female and family spectacle use show association with favorable attitude towards refractive error among primary school teachers. Whereas in multivariable analysis many years of experience, working in private school, being older age, being male and 5^{th} -8^{th} teaching category were found to be significantly associated with attitude (see table 4).

Table 4 Factors associated with attitude among primary school teachers regarding refractive error in school children in Gondar town, Northwest Ethiopia, 2017

Variables	Attitude			
	Favorable	Unfavorable	COR (95% CI)	AOR (95% CI)
Sex				
Female	136	163	1.00	
Male	187	89	2.84(2.00, 4.02)	2.03(1.37, 3.01)***
School type				
Government	215	201	1.00	
Private	108	41	2.46(1.64, 3.70)	1.76(1.06, 2.93)**
Religion				*
Orthodox	242	202	1.00	
Muslim	56	18	2.59(1.48, 4.56)	
Protestant	25	22	0.95(0.52, 1.73)	
Teaching category				
1-4th	116	119	1.00	1.00
5-8th	207	123	1.73(1.23, 2.42)	1.54(1.05, 2.24)**
Marital status				
Single	76	43	1.00	
Married	204	154	0.75(0.49, 1.15)	
Divorced	25	31	1.46(0.24, 0.87)	
Widowed	18	14	0.73(0.33, 1.61)	

Family spec use				*
No	252	173	1.00	
Yes	71	69	0.71(0.48, 1.04)	
Age in years				*
21-30 years	99	56	1.00	1.00
31-40 years	59	47	0.71(0.43, 1.18)	1.56(0.57, 2.37)
41-50 years	56	51	0.62(0.38, 1.03)	1.61(0.64, 4.02)
51-70 years	109	88	0.70(0.46, 1.08)	3.05(1.07, 8.72)**
Years of experience				
1-10 years	94	44	1.00	1.00
11-20 years	85	66	0.60(0.37, 0.98)	0.63(0.30, 1.33)
21- 30 years	75	60	0.59(0.36, 0.95)	0.41(0.15, 1.14)
31-40 years	69	72	0.45(0.28, 0.73)	0.23(0.07, 0.72)**

* Non-significant , ** P-value <0.05, *** p<0.001

As we can noted from table 4 the odds of favorable attitude towards refractive error among study participants, being male was two times greater than the odds of favorable attitude among females [AOR = 2.03 (95% CI: 1.37, 3.01)]. The odds of favorable attitude towards refractive error among study participants aged 51-70 years were three times greater than the odds of favorable attitude for those subjects aged 21-30 years [AOR= 3.05 (95% CI: 1.07, 8.72)]. The odds of favorable attitude towards refractive error among subjects who had 31-40 years of experience were 4.35 times less than the odds of favorable attitude for those subjects who had 1-10 years of experience [AOR= 0.23 (95% CI: 0.07, 0.72)]. The odds of favorable attitude towards refractive error among subjects working in private schools were 1.76 times larger than the odds of favorable attitude among subjects working in government schools [AOR= 1.76 (95% CI: 1.06, 2.93)]. And also the odds of favorable attitude towards refractive error among subjects teaching under 5^{th}-8^{th} category were 1.54 times greater than the odds of favorable attitude among subjects teaching under 1^{st}-4^{th} category [AOR = 1.54 (95% CI: 1.05, 2.24)].

6. Discussion

In this study about 55.9% (95% CI: 51.9, 59.8) of primary school teachers had good knowledge regarding refractive error in school children. This result is lower as compared to other studies in India (68%, 72%), Singapore (73.4%), Nigeria (66.9%), Ghana (82%), Saudi Arabia (88.99%) and Cambodia (66.7%)(16, 18, 20, 21, 26, 28). This discrepancy may be due to difference in accessibility of eye care services and utilization. The other explanation may be a difference in advancement of eye care services and existence of eye health programme in schools in these countries, which can affect their knowledge about refractive error(31).

The odds of good knowledge regarding refractive error among study participants who had previous history of spectacle were two times greater than the odds of good knowledge for those subjects who didn't use spectacle. This finding is also consistent with other research conducted in Singapore(18). This association is due to the fact that one advantage of spectacle use is to correct refractive error and the whys of spectacle wear may be explained to patients before dispensing, so respondents may understand what refractive error is.

In addition to this the odds of good knowledge regarding refractive error among study participants with previous history of eye examination were 1.67 times higher than the odds of good knowledge for those subjects with no history of eye examination. This finding is in line with study conducted in Singapore and India (17, 18). This might be due to the chance to get information and eye health education regarding refractive error while they are visiting eye care center for their ocular problems.

The odds of good knowledge regarding refractive error among study participants who had previous training on eye health were two times greater than the odds of good knowledge for study subjects with no history of training on eye heath. This finding is agreed with other researches done in India and Nigeria (14, 20). This may be due to that training on eye health is inclusive of all important procedures and methods for identification of refractive error in school children. In addition, most of the time training is delivered with thorough practical session on how to test vision, how pupils with refractive error adjust themselves

in class room and its possible consequence on education, in general which raise knowledge level.

The odds of good knowledge regarding refractive error among subjects with 11-20 years of experience were 2.53 times higher than the odds of good knowledge among subjects who had 1-10 years of experience. This finding is agreed with research done in India (16). This is because of as experience increases exposure to eye conditions in student revealed for teachers and they can detect children's eye conditions easily through experience.

In this study about 57.2% (95% CI: 52.9, 61.4) of study participants had favorable attitude towards refractive error in school children. This finding is agreed with the study done in Cambodia(28). But this finding is lower when compared with researches done in America and Ghana (21, 32). This may be due to higher knowledge of elementary school teachers and easily accessible information and eye care providing centers in America and Ghana that can affect their attitude towards refractive error which can brought affirmative attitude(21, 32).

The odds of favorable attitude towards refractive error among study participants aged 51-70 years were three times greater than the odds of favorable attitude for those subjects aged 21-30 years. This association is in line with study done in Cambodia (28).A possible explanation could be that increasing age creates increased awareness about refractive error, as older people are more likely to have refractive error, which could brought attitudinal shift to favorable one.

The odds of favorable attitude towards refractive error among subjects who had 31-40 years of experience were 4.35 times less than the odds of favorable attitude for those subjects who had 1-10 years of experience. This may be because of those with 31-40 years of experience may have refractive error that should be corrected but unable to access spectacles to treat it, which may affect attitude towards refractive error.

The odds of favorable attitude towards refractive error among study participants, being male was two times greater than the odds of favorable attitude among females. The

possible reason for this discrepancy could be socio-cultural effect in the community in which males may exposed to information compared to females.

The odds of favorable attitude towards refractive error among subjects working in private schools were 1.76 times larger than the odds of favorable attitude among subjects working in government schools. This cloud be due to good facilities such as access to internet in private schools that can affect their attitude as compared to governmental schools. The other possible explanation could be study participants in private schools had higher educational level (33% degree holder in private, 11.54% degree holder in government), which can affect their attitude.

The odds of favorable attitude towards refractive error among primary school teachers teaching under 5th-8th category were 1.54 times greater than the odds of favorable attitude among subjects teaching under 1^{st} -4th category. This may be due to education status of those teachers who are teaching under category of 5^{th}-8^{th} are higher than those teacher who are teaching under 1^{st} – 4^{th} category, in which those with higher levels may exposed to eye conditions and brought attitudinal shift. In addition to this teachers under category of 5^{th}-8^{th} may realize problems of their students' vision, since it requires extensive effort due to its difficulty of performing well in this category or students may inform their vision problem to teachers. These all can brought positive attitude towards refractive error.

Limitation of the study

Limitation of the study

- Generalizability of study is limited only to primary school teachers.
- It is difficult to establish the temporal relationship of associated factors that affect knowledge and attitude of study participants.

7. Conclusion

- Knowledge and attitude of study subjects towards refractive error were low.
- Therefore eye health education and training to primary school teachers directed towards bringing a significant change in the knowledge and attitude regarding refractive error must be stepped-up within eye health program.
- Previous training on eye health, 11-20 years of experience, spectacle usage and previous eye examination were found to be significantly associated with knowledge.
- Working in private school, 31-40 years of experience, being older age, being male and 5^{th}-8^{th} teaching category were found to be significantly associated with attitude.

8. Recommendations

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For Gondar city administration health and educational office

- Primary school teachers working in Gondar city needs awareness on the nature and factors associated with refractive error in school children particularly its impact on educational performance on students. So that it is better to create awareness regarding refractive error through different means of communications.

For university of Gondar

- It is recommended to initiate University of Gondar tertiary eye care and training center and the eye care professionals to deliver regular training programme for primary school teachers regarding refractive error. And also it is recommended to establish screening center in the schools by teachers.

For researchers

It will be better if other researchers conduct it in different study design and population to understand the overall knowledge about refractive error.

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10. List of annexes

Annex 1. Information sheet

Title of the research project – knowledge, attitude and associated factors among primary school teachers towards refractive error in school children in Gondar city, 2017.

Name of principal investigator – Abiy Maru

Name of organization- University of Gondar, Gondar College of Medicine and Health Sciences, School of medicine and Department of Optometry

Name of sponsor - University of Gondar

Introduction

This information sheet and consent form was prepared with the aim of studying the knowledge, attitude and associated factors among primary school teachers towards refractive error in school children in Gondar city, 2017. The research group was included the principal investigator, eight trained data collectors, one Supervisor, and two advisors from University of Gondar.

Purpose of the research project

The main purpose of this study was to assess knowledge, attitude and associated factors among primary school teachers towards refractive error in school children in Gondar city.

Procedures

The study involves primary school teachers between April 26 and May 23, 2017. You are selected randomly to be one of the study participants and we kindly invite you to take part in our project. If you are willing to participate, we are so happy and we need you to clearly understand the aim of this study and show your agreement. Finally you are kindly requested to give your genuine response in the interview.

Benefits, Risks and/or Discomfort

By participating in this research project you may feel some discomfort in wasting your time (a maximum of 20 minutes). However, your participation is definitely important to assess knowledge, attitude and associated factors among primary school teachers regarding refractive error in school children which helps us to design appropriate strategy

to provide regular training program, management and prevention of refractive error and its complications. There is no risk in participating in this research project.

Incentives/Payments for Participating

You will not be provided any incentives or payment to take part in this project.

Confidentiality

We will not write your name and the information collected from you will be kept confidential and stored in a file, by assigning a code number to it. Hence, no report of the study ever identifies you.

Right to Refusal or Withdraw

You have the full right to refuse from participating in this research and to withdraw at any time you want.

Person to contact

The research project was reviewed and approved by the ethical committee of the University of Gondar. If you have any question you can contact any of the following individuals and you may ask at any time you want.

Name: Abiy Maru Tele: 0918182413

Name: Gizachew Tilahun Tele: 0912684323

Name: Nebyat Feleke Tele: 0918035619

Annex 2. Informed consent form in English

Name ---------- ID----------

Consent form for interview

Dear participant

You are participating in survey undertaken to determine knowledge and attitude towards refractive error and associated factors. RE has a direct effect on visual status of the eye due to different complications that leads to visual impairment. Therefore it is vital to determine knowledge and attitude towards refractive error and associated factors among primary school teacher. The result of the interview will be collected for research and program planning purposes by University of Gondar, college of Medicine and Health Science Department of Optometry.

With your permission, we would like to:

1. Conduct interview
2. Collect demographic.

You do not have to agree to do these things if you don't want to do**.** You can withdraw your consent at any time. All information that we collect will be confidential and no identifiable information will be released.

I acknowledge that I have understood this consent and the reasons for the study have been explained to me by my own language. I give my consent to participate in the study.

Participant----------sign date----------

Researcher/witness ---------- sign date ----------

Annex 3 – Amharic version of informed consent

የፈቃድ መጠየቂያ ቅፅ

ስም ---------- መለያ ቁጥር ----------

<u>የፈቃድ መጠየቂያ ቅፅ ለመጠይቅ</u>

የተከበሩ ተሳታፊ

እርስዎ የአይን ብርሀንን በትክክል የመቀልበስ ችግር (በመነጸር የሚስተካከል አጥርቶ የማየት ችግር) በተመለከተ ያለዎትን እዉቀት፤ አመለካከትና ተያያዥ ምክንያቶችን ለማወቅ በሚደረገው ጥናት ላይ ይሳተፉሉ፡፡ በመነጸር የሚስተካከል አጥርቶ የማየት ችግር በሁሉም ሰዉ ላይ በብዛት የሚከሰት ና የዕይታ መቀነስ የሚያመጣ በመሆኑ ጥናቱ አስፈላጊ ሆኗል፡፡ ይህ የዳሰሳ ጥናት ዋና ዓላማ በመነጸር የሚስተካከል አጥርቶ የማየትን ችግር በተመለከተ ያለዎትን እዉቀት፤ አመለካከትና ተያያዥ ምክንያቶችን በማወቅ ለጎንደር ዩኒቨርስቲ ህክምናና ጤና ሳይንስ ኮሌጅ የዓይን ህክምና ክፍል በማቅረብ አስፈላጊውን ድጋፍ ለመሰጥት ነው፡፡ ከጥናቱ የሚገኝ የእርስዎ መረጃ ምስጢሩ የተጠበቀና ከጥናቱ ውጪ ለምንም ጉዳይ የማንጠቀምበት መሆኑን ለመግለፅ እንወዳለን፡፡

በእርሶ ፍቃድ እኛ የምንፈልገው፡-

1. ከእርስዎ ጋር ቃለመጠይቅ ማድረግ
2. ማህበራዊ ጉዳዮችን በተመለከተ መረጃ መሰብሰብ፡፡

በጥናቱ ላይ መሳተፍም አለመሳተፍም ይችላሉ፡፡ መሃል ላይ የማይመች ነገር ካለ ማቋረጥ ይችላሉ፡፡ ነገር ግን የእርስዎ መሳተፍ ለጥናቱ ወሳኝ በመሆኑና መረጃዎ ምስጢሩ የተጠበቀ ስለሆነ እንዲሳተፉ እንመክሮታለን፡፡

የዚህ ጥናት ዓላማ፣ ጥቅሙ ና ጉዳቱ በግልፅ በሚገባኝ ቋንቋ ስለ ተነገረኝ በጥናቱ ለመሳትፍ ተስማምቻለሁ፡፡

ስም ---------- ፊርማ ---------- ቀን ----------

የጥናቱ ባለቤት ----------ፊርማ ---------- ቀን ----------

Annex 4. **English version of data extraction format**

Pre tested structured questionnaire for determining knowledge and attitude towards RE and associated factors among primary school teachers in Gondar city, Northwest Ethiopia.

Introduction

Good morning/afternoon, my name is ---------- I am working for University of Gondar. I am a member of a research group working in GUH. I am studying knowledge, attitude and associated factors among primary school teachers towards refractive error in school children in Gondar city by asking questions. Your aqppropriate answers for all of our questions are important to know knowledge and attitude towards refractive error and associated factors. Your answers will be confidential and keep in secret. If you decide that, you do not want to participate in the study now or at any time in the future; it is your right not to participate in the study. But we appreciate if you participate and will take 20 minutes for us to complete the questionnaire. Thank you. Next, I will read a consent, which assures your interest to participate.

Do I have your permission to continue?

If yes thank you and continue ----------

If no, thank you and go to next study subject ----------

Data collector

Name ---------- signature ---------- date ----------

Checked by supervisor

Name ---------- signature---------- date----------

1. questions related to socio-demographic characteristics			
S. N	**Questions**	**Responses Category/answers**	**Remark**
1	Age in years	**……**	
2	Sex	1. Male 2. Female	
3	Religion	1. Orthodox 2. Muslim 3. Catholic 4. Protestant 5. Others specify	
4	Marital status	1. Single 2. Married 3. Divorced 4. widowed	
5	Monthly Income in birr	……	
2. Education related factors			
6	Educational status	1. Certificate 2. Diploma 3. Degree 4. Masters and above	
7	Year of experience in years	……..	
8	Major teaching category	1. 1^{st}-4^{th} 2. 5^{th} -8^{th}	
9	School type	1. Government 2. Private	
3. eye condition related factors			
10	Spectacle use	1. Yes 2. No	
11	Duration of spectacle use in years	……..	
12	Do you have eye examination before?	1. Yes 2. No	
4. information related question			
13	Did you have training on eye health before?	1. Yes 2. No	
14	Did any of your family use spectacle?	1. Yes 2. No	

P art II Knowledge related questions	
1. How do you describe refractive error?	A. An able to focus parallel rays of light coming from infinite B. Reduction of vision C. I don't know D. Others specify……
2. What are symptoms of refractive error? (You can choose more than one answers).	
	A. Blurring of vision B. Complaining of headaches C. Rubbing eyes frequently D. Avoiding close work E. Others specify……..
3. Refractive errors occur when	
	A. Eye infections are present B. Nutritional deficiencies are present C. Shape of eye prevent light rays from focusing D. Others specify
4. Risk factor for refractive error include	
	A. Family history of refractive error B. Contact with children with refractive error C. Vitamin deficiency D.I don't know E.Others specify……..
5. Refractive error can	
	A. Not affect academic performance B. Lead to poor academic performance C. Improve the academic performance D. I don't know E. Other specify

6. Child with refractive error can develop	
	A. Squint B. Lazy eye C. I don't know D. Others specify…..
7. Refractive error affects	
	A. Only Near vision B. Only Distant vision C. Vision at different distances D. I don't know E. Other specify…….
8. Undetected refractive errors in childhood may lead to behavioral problems and adversely affect social interaction	
	A. Yes B. No C. I do not know
9. Can refractive error cause blindness	
	A. Yes B. No C. I don't know
10. How can you detect refractive error	
	A. With retinoscope/eye examination B. Visual acuity test C. I do not know D. Others specify
11. What are the correction means of refractive error other than spectacles?	
	A. Contact lens B. Refractive surgery C. Surgery D. I don't know E. Others specify ……..

Part III Questions related to Attitude towards refractive error

	Strongly agree	Agree	neutral	Disagree	Strongly disagree
12. Refraction in children should not be done only when the caregiver complains					
13. Refraction in children should not only done by an eye care provider.					
14. We can prevent the complications/impact of refractive error on children.					
15. Children can use spectacles effectively and comfortably.					
16. Refractive error cannot be treated with eye drops.					
17. Schoolchildren with visual impairment can attend school.					
18. Vision screening must be done when children start schooling.					
19. Improper use of correctly prescribed spectacles can impose damage on children.					
20. Did you use any of the following information to answer questions regarding refractive error?	1. Mass media 2.Heath personnel 3. Colleague 4. I didn't use any information 5. Other specify……				

Annex 5: Amharic version of data extraction format

የጎንደር ዩኒቨርሲቲ ህክምና ና ጤና ሳይንስ ኮሌጅ የዓይን ህክምና ክፍል

መለያ ቁጥር ----------

የት/ቤቱ ስም----------

<u>የመጠይቅ ቅፅ</u>

ጤና ይስጥልኝ ---------- እባላለሁ፡፡ የጎንደር ዩነቨርስቲ ሠተራተኛ ና የዩነቨርስቲው የጥናት ቡድን አባል ነኝ፡፡ በመነጸር የሚስተካከል አጥርቶ የማየት ችግርን በተመለከተ መምህራን ያላቸዉን እዉቀት፣ አመለካከትና ተያያዥ ምክንያቶችን በጎንደር ከተማ ውስጥ በሚገኙት አንደኛ ደረጃ መምህራን መካከል ቃለ መጠይቅ በማድረግ እያጠናን እንገኛለን፡፡ ይህ ጥናት እርስዎ በሚሰጡን መረጃ ላይ የተመሰረተ ስለሆነ ፍቃድዎ ከሆነ መረጃውን በመስጠት ትብብር እንዲያደርጉልን በትህትና እንጠይቃለን፡፡በጥናቱ ላይ መሳተፍ የማይፈልጉ ከሆነ አሁንም ሆነ በሂደት ወስጥ አለመስማማት ይችላሉ፡፡ ሆኖም ግን ጥናቱ ከትንሽ ጊዜ መፍጀት ውጪ ምንም አይነት ጉዳት የማያመጣ ስለሆነ እንዲሳተፉ እናበረታተለን፡፡ መረጃዎ ምስጢራዊነቱ የተጠበቀ፣ ለጥናቱ ብቻ የሚውልና ለሌላ ጉዳይ የማንጠቀምበት መሆኑን ልናረጋግጥልዎ እንወዳለን፡፡ ቃለ መጠይቁ 20 ደቂቃ የሚፈጅ ስለሆነ ፍቃደኝነትዎን በፊርማ እንዲያረጋግጡልንና ዉል እንዲወስዱልን በትህትና እየጠየቅን ወደ ቃለ መጠይቁ እንሄዳለን፡፡

ለመሳተፍ ፈቃደኛ ከሆኑ ወደ ሚቀጥለው ገፅ ይለፉ.

ማንኛውም ሊያነሱ የሚፈልጉት ጥያቄ ካለዎት ተመራማሪውን በሚቀጥለው አድራሻ ማነጋገር ይችላሉ፡፡

ስም ፡ ዐቢይ ማሩ

ስ. ቁ፡ 0918182413

<u>መረጃ ውን የሰበሰበው</u>

ስም ---------- ፊርማ ---------- ቀን ----------

<u>መረጃውን ያረጋገጠው</u>

ስም---------- ፊርማ ---------- ቀን ----------

ሀ. ማኅበራዊ መረጃ በተመለከተ		
ተ.ቁ	ጥያቄ	የመልስ አማራጭ
1	ዕድሜ በዓመት	……
2	ፆታ	1. ወንድ 2. ሴት
3	የጋብቻ ሁኔታ	ነ. ያላገባ/ች 2. ያገባ/ች 3. የፈታ/ች 4. የሞተበት/ባት
4	ሀይማኖት	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ ካለ ይጥቀሱ……
5	ወርሀዊ ገቢ በብር	……
ለ. ትምህርታዊ ጉዳዮችን በተመለከተ		
6	የትምህርት ደረጃ	ሰርተፊኬት 2. ዲፕሎማ 3. ዲግሪ 4. ማስተርስና ከዚያ በላይ
7	ማስተማር ከጀመርሩ ስንት አመት ሆነዎት፣ በአመት ?	……
8	እያሰተማሩበት ያለዉ የክፍል ደረጃ	ነ. ከ1-4ኛ ክፍል 2. ከ5-8ኛ ክፍል 3. ሌላ ካለ ይጥቀሱ……
9	የሚያስተምሩበት ትምህርት ቤት አይነት	1. የግል 2. የመንግስት
ሐ. የአይን በሽታ በተመለከተ		
10	የአይን ምርመራ አድርገዉ ያዉቃሉ ወይ?	ነ. አወ 2. አላዉቅም
11	መነፀር ይጠቀማሉ? መልስዎ አልጠቀምም ከሆነ ወደ ጥ.ቁ 13 ይሂዱ	ነ. እጠቀማለሁ 2. አልጠቀምም
12	መነፀር መጠቀም ከጀመሩ ስንት አመት ሆነዎት	----------
መ. መረጃን በተመለከተ		
13	የአይንን ጤና በተመለከተ ስልጠና ወስደዉ ያዉቃሉ	ነ. አዉቃለሁ 2. አላዉቅም
14	ከቤተሰብዎ መካከል መነጸር የሚጠቀም ሰዉ አለ?	ነ. አለ 2. የለም

መመሪያ፡- ይህ መጠይቅ በመነፀር የሚስተካከል አጥርቶ ስለማየት ችግር (sight problem) ያለዎትን እዉቀትና አመለካካት ለመለካት የተዘጋጀ ነዉ፡፡ እባክዎት እያንዳንዱን ጥያቄ በጥንቃቄ ካነበቡ በኋላ ከተዘረዘሩት ምርጫዎች ዉስጥ መልስ ይሆናል ያሉትን ያክብቡ፡፡

ክፍል 2 እዉቀትን በተመለከተ	
1. በመነፀር የሚስተካከል አጥርቶ የማየት ችግርን እንዴት ይገልጹታል?	1. የአይን ምስል ተሸካሚ ብርሀን ቦታዉ ላይ በትክክል አለማረፍ ነዉ 2. የአይን የማየት አቅም መቀነስ ነዉ 3. አላዉቅም 4. ሌላ ካለ ይጥቀሱ.....
2. በመነፀር የሚስተካከል አጥርቶ የማየት ችግር ምልክቱቶች ምንድን ናቸዉ? (ከአንድ በላይ መምረጥ ይቻላል)	1. ብዥታ ያመጣል 2. ራስ ምታት ያመጣል 3. አይንን በተደጋጋሚ ማሸት 4. የቅርብ ስራዎችን ለመስራት መቸገር 5. አላዉቅም 6. ሌላ ካለ ይጥቀሱ.....
3. በመነፀር የሚስተካከል አጥርቶ የማየት ችግር በምን ምክንያት ይከሰታል ብለዉ ያስባሉ?	1. በበሽታ አምጭ ህዋሳት ሲጠቃ(ኢንፌክሽን) 2. በምግብ እጥረት 3. የአይን ብርሀንን አብዝቶ(አሳንሶ) በመቀልበስ ግልጽ ምስል ባለመፈጠር 4. አላዉቅም 5. ሌላ ካለ ይጥቀሱ.....
4. በመነጸር ለሚስተካከል አጥርቶ የማየት ችግር ተጋላጭ የሚያደርገዉ ምን ሊሆን ይችላል?	1. ከቤተሰብ ተመሳሳይ ችግር ካለ 2. ችግሩ ካለባቸዉ ልጆች ጋር በመነካካት 3. የቫይታሚን ኤ እጥረት 4. አላዉቅም 5. ሌላ ካለ ይጥቀሱ.....
5. በመነጸር የሚስተካከል አጥርቶ የማየት ችግር በልጆች ት/ት ላይ ምን ሊያስከትል ይችላል?	1. በትምህርት ላይ ተፅዕኖ የለዉም 2. ለዝቅተኛ ዉጤት ይዳርጋል 3. በትምህርት ላይ መሻሻል እንዲኖር ይረዳል 4. አላዉቅም 5. ሌላ ካለ ይጥቀሱ.....
6. በመነጸር የሚስተካከል አጥርቶ የማየት ችግር በልጆች እይታ ላይ ምን ሊያስከትል ይችላል?	1. የአይን መንሸዋረር 2. የአይን እይታ መስነፍ 3. አላዉቅም 4. ሌላ ካለ ይጥቀሱ.....
7. በመነጸር የሚስተካከል አጥርቶ የማየት ችግር የትኛዉን የንባብ ሁኔታ ሊያዉክ ይችላል?	1. ቅርብ ላይ ማንበብን 2. ርቀት ላይ የማንበብን 3. ሁሉም ርቀት ላይ በግልፅ የማየት ችግር 4. አላዉቅም 5. ሌላ ካለ ይጥቀሱ.....

8. በጊዜዉ ያልታከመ በመነጸር የሚስተካከል አጥርቶ የማየት ችግር በልጆች ላይ ባህሪያዊና ማህበራዊ ተፅዕኖ አለዉ።	1. እዉነት 2. ሀሰት 3. አላዉቅም
9. በመነጸር የሚስተካከል አጥርቶ የማየት ችግር አይነስዉረነትን ያሰከትላል።	1. እዉነት 2. ሀሰት 3. አላዉቅም
10. በመነጸር የሚስተካከል አጥርቶ የማየት ችግር እንዳለ እንዴት ማወቅ ይቻላል?	1. በአይን ምርመራ መሳሪያ 2. የእይታ መጠንን በመለካት 3. አላዉቅም 4. ሌላ ካለ ይጥቀሱ.....
11. በመነፀር የሚስተካከል አጥርቶ የማየት ችግር ማከም የሚቻልበት ሌላ መንገድ ምን ሊሆን ይቻላል?	1. ብሌን ላይ በሚለጠፍ ሌንስ 2. በጨረራ ህክምና 3. በቀዶ ጥገና 4. አላዉቅም 5. ሌላ ካለ ይጥቀሱ.....

ክፍል 3 አመለካከትን በተመለከተ

	በጣም እስማማለሁ	እስማማለሁ	ገለልተኛ	አልስማማም	በጣም አልስማማም
12. ልጆች የአይን ምርመራ የሚደረግላቸዉ ወላጅ/ አሳዳጊ ሲጠይቅ ብቻ መሆን የለበትም።					
13. የልጆችን አይን ምርመራ ማድረግ ያለበት የአይን ጤና ባለሙያ ብቻ መሆን የለበትም።					
14. በልጆች ላይ የሚከሰተዉን በመነፀር የሚስተካከል አጥርቶ የማየት ችግር የሚያደርሰዉን ጉዳት መከላከል ይቻላል።					
15. ልጆች መነፀርን በአግባቡ መጠቀም ይችላሉ።					
16. በመነፀር የሚስተካከል አጥርቶ የማየት ችግርን በአይን ጠብታ መድሀኒት ማከም አይቻልም።					
17. የእይታ ችግር ያለባቸዉ ተማሪዎች ትምህርት መከታተል ይችላሉ።					
18. ልጆች ት/ት ሲጀምሩ የእይታ መጠን ልኬታ መደረግ አለበት።					
19. ልጆች በሀኪም የታዘዘላቸዉን መነፀር በአግባቡ ካልተጠቀሙ እይታቸዉ ይጎዳል።					
20. በመነፀር የሚስተካከል አጥርቶ የማየት ችግር በተመለከተ ያለዎትን መረጃ የት አገኙት?(ከአንድ በላይ መምረጥ ይቻላል)	ሀ. ከመገናኛ ብዙሀን ለ. ከጤና ባለሙያ ሐ. ከጓደኛ መ. ሌላ ካለ ይጥቀሱ.....				

Annex 6: Declaration

I, the undersigned, senior clinical optometry student declare that this thesis report is my original work in partial fulfillment of the requirement for the degree of Master of clinical optometry.

Name: Abiy Maru

Signature: ----------

Place of submission: University of Gondar, College of Medicine and Health Sciences, Department of Optometry

Date of Submission: ----------

This thesis report work has been submitted for ethical review with our approval as university advisor(s).

Advisors

Name	Signature	date
Mr. Gizachew Tilahun	----------	----------
Mr. Nebiyat Feleke	----------	----------

Annex 7: Assurance of Investigator

The undersigned agrees to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as pre terms and conditions of the research and publications office of the University of Gondar.

Name of the student: Abiy Maru

Date: ---------- Signature: ----------

Approval of the advisor (s)

Advisors

Name	Signature	Date
1. Mr. Gizachew Tilahun	----------	----------
2. Mr. Nebyat Feleke	----------	----------